This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims</u>:

Claim 1 (Currently Amended): An image processing device for processing each pixel of an image to convert multitone image data into data of a format represented by the dot on-off state for each said pixel, along a raster consisting of a row of said pixels, said device comprising:

tone error calculating unit that, during said conversion for each said pixel, calculates tone error corresponding error in tone representation occurring in a pixel of interest having undergone said conversion;

matrix storage unit that stores a plurality of types of error diffusion matrices of different diffusion range size, said error diffusion matrices indicating weights for each pixel, for diffusing said tone error into unprocessed pixels neighboring said pixel of interest;

matrix selection unit that selects a single error diffusion matrix from among said stored plurality of types of error diffusion matrices, depending on the image data for said pixel of interest;

error diffusion unit that diffuses said tone error into peripheral pixels adjacent to said pixel of interest, in accordance with said selected matrix; and

data conversion unit that converts said image data into data of a format represented by the dot on-off state for said pixel of interest, while considering said tone error diffused from processed peripheral pixels, and

wherein said matrix storage unit ~~is means having~~ <u>has</u> prestored therein at least one error diffusion matrix with a directivity factor, which indicates the extent of diffusion of said tone error in said raster direction, to be 2.0 or higher, as said error diffusion matrix having ~~the~~ <u>a</u> widest ~~said~~ diffusion range in said raster direction.

Claim 2 (Currently Amended): An image processing device according to claim 1, wherein said matrix selection unit selects an error diffusion matrix having a wider ~~said~~ diffusion range the smaller the image data of said pixel of interest.

Claim 3 (Original): An image processing device according to claim 1, wherein said matrix selection unit selects said single error diffusion matrix in consideration of said conversion result for said pixel of interest, in addition to the image data for said pixel of interest.

Claim 4 (Currently Amended): An image processing device according to claim 1, wherein said matrix storage has stored therein error diffusion matrices of larger ~~said~~ directivity factor the wider ~~said~~ a diffusion range.

Claim 5 (Currently Amended): An image processing device according to claim 1, wherein said matrix storage ~~means~~ unit has stored therein a matrix whose ~~said~~ diffusion range is limited to within both of a raster including said pixel of interest and a raster adjacent to said raster, as regards said error diffusion matrix whose ~~the~~ directivity factor is 2.0 or higher.

Claim 6 (Original): An image processing device according to claim 1, wherein said matrix selection unit selects an error diffusion matrix having the widest diffusion range in said raster direction, when said pixel of interest meets the following two conditions:

(a) the condition that the absolute value of the difference between the tone value represented by said dot on-off state on said pixel of interest and the tone value of the image data for said pixel of interest is equal or greater than a predetermined value; and

(b) the condition that the tone value of the image data of said pixel of interest is in at least one area which is either a low tone area smaller than a predetermined first threshold value, or a high tone area greater than a predetermined second threshold value wherein the first threshold value is smaller the second threshold value.

Claim 7 (Currently Amended): An image processing device according to claim 6, wherein said matrix storage unit has stored therein, in addition to said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher, an error diffusion matrix whose ~~said~~ directivity factor is 1.0 or lower, and

said matrix selection unit selects said error diffusion matrix with a directivity factor of 1.0 or lower in the event that said tone value difference is smaller than a predetermined value.

Claim 8 (Currently Amended): An image processing device according to claim 6, wherein said matrix selection unit selects said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher, in the event that the tone value of said image data for said pixel of interest is smaller than said first threshold value, and a ~~said~~ dot is formed on said pixel of interest.

Claim 9 (Currently Amended): An image processing device according to claim 6, wherein said matrix selection unit selects said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher, in the event that the tone value of said image data for said pixel of interest is greater than said second threshold value, and no ~~said~~ dot is formed on said pixel of interest.

Claim 10 (Currently Amended): An image processing device according to claim 6, wherein said matrix selection unit selects the error diffusion matrix having ~~the~~ a wider diffusion range the larger said tone difference, in addition to said two conditions.

Claim 11 (Currently Amended): An image processing device according to claim 10, wherein said matrix storage unit has stored therein a plurality of error diffusion matrices of higher ~~said~~ directivity factors the wider ~~the~~ a diffusion range in said raster direction, as said plurality of types of error diffusion matrices.

Claim 12 (Currently Amended): An image processing device according to claim 6, wherein said matrix storage unit has stored therein at least one error diffusion matrix whose ~~said~~ diffusion range is limited to within both a raster including said pixel of interest and a raster adjacent to said raster, as regards said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher.

Claim 13 (Currently Amended): An image processing device according to claim 12, wherein said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher has a limited diffusion range to within either the raster including said pixel of interest or the raster adjacent to said raster, in the extent beyond a predetermined distance in the raster forward direction which is the direction in which image data is converted along a raster from said pixel of interest.

Claim 14 (Currently Amended): An image processing device according to claim 13, wherein said error diffusion matrix whose ~~a~~ directivity factor is 2.0 or higher has a limited diffusion range to within the raster adjacent the raster including said pixel of interest, in the opposite direction from said raster forward direction [[,]].

Claim 15 (Original): An image processing device according to claim 1, further comprising:

superpixel generating unit that groups predetermined numbers of adjacent pixels into groups as superpixels,

wherein said tone error calculating unit, said matrix storage unit, said matrix selection unit, said error diffusion unit, and said data conversion unit perform each process on said superpixels.

Claim 16 (Original): Image processing method for processing each pixel of an image to convert multitone image data into data of a format represented by the dot on-off state for each said pixel, along a raster consisting of a row of said pixels, the method comprising the following steps:

first step for providing a plurality of types of error diffusion matrices which respectively define different diffusion condition including a directivity factor which indicates the extent of diffusion in said raster direction of tone error to be occurring in said conversion at a pixel of interest, wherein said error diffusion matrices indicate weights for each said peripheral pixel and said directivity factor of an error diffusion matrix which has the widest diffusion range in said raster direction is 2.0 or higher;

second step for calculating said tone error of said pixel of interest, each time that said image data is converted to data of a format represented by the dot on-off state for each said pixel;

third step for selecting one error diffusion matrix among said stored plurality of types of error diffusion matrices, based on the image data for said pixel of interest;

fourth step for diffusing said tone error into unprocessed peripheral pixels adjacent to said pixel of interest based on said weights of said selected matrix; and

fifth step for converting said image data into data of the format represented by the dot on-off state for said pixel of interest in consideration of said tone error diffused from processed peripheral pixels.

Claim 17 (Original): Image processing method according to claim 16, wherein said third step selects an error diffusion matrix having the widest diffusion range in said raster direction, when said pixel of interest meets the following two conditions:

(a) the condition that the absolute value of the difference between the tone value represented by said dot on-off state on said pixel of interest and the tone value of the image data for said pixel of interest is equal or greater than a predetermined value; and

(b) the condition that the tone value of the image data of said pixel of interest is in at least one area which is either a low tone area smaller than a predetermined first threshold value, or a high tone area greater than a predetermined second threshold value wherein the first threshold value is smaller the second threshold value.

Claim 18 (Original): A program product for processing each pixel of an image to convert multitone image data into data of a format represented by the dot on-off state for each said pixel, along a raster consisting of a row of said pixels, said program product comprising: a computer readable medium; and computer program code means stored on said computer readable medium, said computer program code means comprising:

first program code means for providing a plurality of types of error diffusion matrices which respectively define different diffusion condition including a directivity factor which indicates the extent of diffusion in said raster direction of tone error to be occurring in said conversion at a pixel of interest, wherein said error diffusion matrices indicate weights for each said peripheral pixel and said directivity factor of an error diffusion matrix which has the widest diffusion range in said raster direction is 2.0 or higher;

second program code means for calculating said tone error of said pixel of interest, each time that said image data is converted to data of a format represented by the dot on-off state for each said pixel;

third program code means for selecting one error diffusion matrix among said stored plurality of types of error diffusion matrices, based on the image data for said pixel of interest;

fourth program code means for diffusing said tone error into unprocessed peripheral pixels adjacent to said pixel of interest based on said weights of said selected matrix; and

fifth program code means for converting said image data into data of the format represented by the dot on-off state for said pixel of interest in consideration of said tone error diffused from processed peripheral pixels.

Claim 19 (Original): A program product according to claim 18, wherein said third program code means selects an error diffusion matrix having the widest diffusion range in said raster direction, when said pixel of interest meets the following two conditions:

(a) the condition that the absolute value of the difference between the tone value represented by said dot on-off state on said pixel of interest and the tone value of the image data for said pixel of interest is equal or greater than a predetermined value; and

(b) the condition that the tone value of the image data of said pixel of interest is in at least one area which is either a low tone area smaller than a predetermined first threshold value, or a high tone area greater than a predetermined second threshold value wherein the first threshold value is smaller the second threshold value.